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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,277	08/01/2003	Chang Wei	124853 (GEGRC 0106 PA)	5091
7590	03/23/2005		EXAMINER ROSENBERGER, FREDERICK F	
Steven W. Hays Suite 250 28333 Telegraph Road Southfield, MI 48034			ART UNIT 2878	PAPER NUMBER

DATE MAILED: 03/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/632,277	Applicant(s) WEI ET AL.	
	Examiner Frederick F. Rosenberger	Art Unit 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>8/1/03</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. Applicant's Information Disclosure Statement, dated August 1<sup>st</sup>, 2003, has been reviewed and considered. However, it is noted that while the IDS states that a second page exists (i.e. page 1 of 2 listed at the top), only one page has been received. As such, only the references cited on the sheet returned with this Office action have been considered.

### ***Specification***

2. The use of the trademarks HiLite, Epotek, Hysol, and Saran has been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

3. The disclosure is objected to because of the following informalities:

On Page 8, line 2 of paragraph 31, "as" should be --a--.

On Page 10, line 7 of paragraph 41, "1.5kw" should be --1.5kW--.

On Page 12, line 10 of paragraph 45, --are-- should be placed before "removed".

Appropriate correction is required.

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4. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Claim 4 recites that the smoothing layer can have a thickness ranging from 0.5-10  $\mu\text{m}$ . However, the range for the thickness of the smoothing layer has only been discussed in the specifications as 2-5  $\mu\text{m}$  (paragraph 37).

### ***Claim Objections***

5. Claims 15, 20, 34, and 37 are objected to because of the following informalities:

In claim 15, lines 1-2, "said top layer further comprising" should be --wherein said top layer further comprises--.

In claim 20, line 8, "said smoothing layer" lacks antecedent basis in the preceding parts of the claim. The antecedent basis can be established by changing "layer" to --coating-- in the above phrase.

In claim 34, line 10, "said reducing agent layer" lacks antecedent basis in the preceding parts of the claim. The antecedent basis can be established by removing "layer" from the above phrase.

In claim 37, line 4, "said gap" lacks antecedent basis in the preceding parts of the claim and in parent claim 34.

In claim 37, lines 1-2, "reducing agent solution" lacks antecedent basis in the preceding parts of the claim and in parent claim 34. The antecedent basis can be established by removing "solution" from the above phrase.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 37 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 37, applicant claims that the reducing agent solution and metal complex solution of claim 34 are mixed prior to application to the adjacent surfaces within the gap. However, in parent claim 34, the solutions are never applied to the surfaces of the gap, but only to the smoothing coating. It is unclear whether applicant intends to have the mixture of reducing agent and metal complex applied prior to the application of the smoothing coating through this recitation. Further, parent claim 34 recites a degassing step between the application of the reducing agent and the application of the metal complex. The combination of the application of the reducing agent and the metal complex renders this degassing step indefinite as it is unclear when such a step would take place or if it should take place at all.

For the purposes of this Office action, claim 37 has been interpreted such that the reducing agent solution and metal complex solution are mixed prior to application to the smoothing layer, wherein the smoothing layer coats the top surface and

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adjacent side surfaces of each scintillator element, and wherein the degassing step is no longer necessary after deposition of the mixed solutions.

8. Claims 6, 17, and 21 contain the trademark/trade name Epotek (claims 6 and 21), Hysol (claims 6 and 21), Saran (claims 6, 17, and 21), and Teflon (claim 17).

Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe appropriate polymer materials for use as either a smoothening layer (claims 6 and 21) or an encapsulant layer (claim 17), and, accordingly, the identification/description is indefinite.

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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10. Claims 1, 4-5, and 9-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kingsley et al. (US Patent # 5,179,284) in view of Akai (US Patent # 5,378,894).

Kingsley et al. disclose a method for forming and an apparatus including a reflective and protective coating for a scintillator array **30** (Figure 1) for radiation imaging comprising:

A smoothening layer, in the form of pellicle layer **40** used to compensate for the surface roughness of the scintillator (column 3, lines 44-51);

A metallic reflective layer **52A** of silver (column 4, lines 11-14) with a thickness of 100-2000 Angstroms (column 4, lines 14-16);

A top layer **52B** of gold (column 4, lines 16-21) applied to the metallic reflective layer **52A** to provide an environmental barrier;

And a polymer encapsulant layer **54** of silicon potting compound (column 4, lines 57-63) with a thickness of 250-1000  $\mu\text{m}$ .

Kingsley et al. further disclose that if the metallic reflective layer **52A** is made of a metal other than silver, than the top protective layer **52B** is not necessary. Thus, the top layer would instead be the polymer encapsulant layer **54**, per the limitations of claim 18.

Kingsley et al. also do not disclose that the reflective layer is provided on the sidewalls of the scintillator elements. Instead, Kingsley et al. only provide for the reflective/protective layers on the top surface of the scintillator, as illustrated in Figure 1.

Akai teaches a multi-layer reflective channel separators provided on the sidewalls of adjacent scintillator elements in an X-ray detector. With reference to Figure 2, Akai provides individual scintillators **11** with separator **120** comprising a white polyester sheet **1** and an aluminum film **2**. Akai notes that the purpose of the separator between adjacent scintillator elements is to effectively conduct the visible emitted light from the scintillator to corresponding photodiodes (column 1, lines 41-46).

Thus it would have been obvious for a person having ordinary skill in the art to modify the reflective layer of Kingsley et al. such that the layer coats the sidewalls as well as the top surface of the individual scintillator elements to better promote light guiding to respective photodiodes and thus prevent crosstalk between adjacent elements, as taught by Akai.

Kingsley et al. are further silent with regards to the claimed thickness and material of the smoothening layer. Kingsley et al. provide for a smoothening layer in the form of pellicle layer **40**, which is a 200-600 Angstroms thick layer of nitrocellulose, poly(para-xylene), organopolysiloxanepolycarbonate, or kryolite. Such materials satisfy the limitations of claim 5, depending on the polymer coating temperature and the emission wavelength. Further, it would have been an obvious matter of design choice to provide for a thicker smoothening layer dependent on the geometry and surface roughness of the scintillator, since such a modification would have involved a mere change in thickness of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1955).



Kingsley et al. also do not disclose that the polymeric encapsulant compound is one of the claimed materials or that the thickness of the polymeric encapsulant layer is 5-10  $\mu\text{m}$ . However, it would have been an obvious matter of design choice to use one of the claimed materials with a thickness of 5-10  $\mu\text{m}$  since applicant has not disclosed that the selection of the polymer encapsulant layer material and maximum thickness is critical to the invention and it appears that the invention would perform equally well with a thicker layer of silicon potting compound.

11. Claims 2-3, 6-8, and 21-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kingsley et al. and Akai, as applied to claims 1, 5, and 20 above, and further in view of Yoshida et al. (US Patent Application Publication # 2002/0196628).

The combination of Kingsley et al. and Akai disclose all of the limitations of the parent claims 1 and 5, as discussed above.

However, the combination of Kingsley et al. and Akai do not disclose that the smoothing layer could be etched.

Yoshida et al. teach that the substrate A (Figure 1), equivalent to the pellicle layer of Kingsley et al. and the smoothing layer of the claimed invention, may be etched via corona discharge or glow discharge, equivalent to an Argon plasma etch, to enhance the surface smoothness, thus providing a smooth first layer for the buildup of additional layers (paragraph 61).

Thus it would have been obvious for a person having ordinary skill in the art to modify the combination of Kingsley et al. and Akai to etch the smoothing layer to

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enhance the smoothness of the smoothening layer for the buildup of subsequent layers, as taught by Yoshida et al.

With regards to the limitations of claim 6, the combination of Kingsley et al., Akai, and Yoshida et al. disclose the claimed invention except for the exact materials claimed. It would have been an obvious matter of design choice to use any polymer material that meets the limitations of claim 5 for the smoothening layer since applicant has not disclosed that the particular list of materials in claim 6 solves is critical to the invention and it appears that the invention would perform equally well with any polymer material that meets the limitations of claim 5.

The combination of Kingsley et al. and Akai are further silent with regards to an adhesion layer between the smoothening layer and the metal layer, as well as the associated characteristics of the adhesion layer.

Yoshida et al. teach an underlying layer **B** (Figure 1), equivalent to the adhesion layer of the claimed invention, which connects the metal layer **C** to the substrate film **A**. The adhesion layer is a thin metal film (paragraph 63) with a thickness in the range of 5-50 nm for connecting the silver metal layer to the substrate film. The use of a metal as the adhesion layer with a thickness in the given range provides a sufficient barrier effect while promoting good adhesion between the metal layer and the polymer film (paragraphs 12-13 and 73).

Thus it would have been obvious for a person having ordinary skill in the art to modify the combination of Kingsley et al. and Akai to provide a metal adhesion layer with a thickness in the range of 5-50 nm between the metal reflective layer and the

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polymer smoothening layer to improve adhesion and protect the metal reflective layer, as taught by Yoshida et al.

With regards to claims 23-26, Kingsley et al. are further silent with regards to the manner in which deposition of the metal reflective layer occurs.

Yoshida et al. teach that the formation of the various metal layers **B**, **C**, and **D** (Figure 1) can be achieved using well known methods in the art, such as metal deposition from solution or vacuum film forming methods, including EB evaporation, ion beam assisted vapor deposition, sputtering, or other vacuum deposition methods (paragraph 67).

Thus, it would have been obvious for a person having ordinary skill in the art to modify the combination of Kingsley et al. and Akai such that the metal layer is deposited via a vacuum film forming methods or metal deposition from solution via chemical reduction since it was known in the art that such methods are equivalent for deposition of a metal layer, as taught by Yoshida et al.

12. Claims 27-28, 31-32, and 34-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kingsley et al. (US Patent # 5,179,294), in view of Akai (US Patent # 5,378,894) and Bahls (US Patent # 3,983,266).

Kingsley et al. disclose a method for forming a reflective and protective coating for a scintillator array **30** (Figure 1) for radiation imaging comprising the steps of applying a smoothening layer to the top surface of each scintillator in an array, in the form of pellicle layer **40** used to compensate for the surface roughness of the scintillator

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(column 3, lines 44-51) and applying a metallic reflective layer **52A** of silver (column 4, lines 11-14) with a thickness of 100-2000 Angstroms (column 4, lines 14-16).

Kingsley et al. do not disclose that the reflective layer is provided on the sidewalls of the scintillator elements. Instead, Kingsley et al. only provide for the reflective/protective layers on the top surface of the scintillator, as illustrated in Figure 1.

Akai teaches a multi-layer reflective channel separators provided on the sidewalls of adjacent scintillator elements in an X-ray detector. With reference to Figure 2, Akai provides individual scintillators **11** with separator **120** comprising a white polyester sheet **1** and an aluminum film **2**. Akai notes that the purpose of the separator between adjacent scintillator elements is to effectively conduct the visible emitted light from the scintillator to corresponding photodiodes (column 1, lines 41-46).

Thus it would have been obvious for a person having ordinary skill in the art to modify the reflective layer of Kingsley et al. such that the layer coats the sidewalls as well as the top surface of the individual scintillator elements to better promote light guiding to respective photodiodes and thus prevent crosstalk between adjacent elements, as taught by Akai.

Kingsley et al. are further silent with regards to the use of a reducing agent and metal complex to form the metal reflective layer.

Bahls teaches a method for deposition of silver formed from a reducing agent of sorbitol (column 4, lines 8-14) and a silver amine complex (column 3, lines 55-57), wherein the reducing agent and the silver complex are applied separately via spray guns to the deposition substrate (column 4, lines 17-31). Bahls also teaches that

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glucose (column 1, lines 26-29) or a solution of Rochelle salt (column 5, lines 10-11) can be used as a reducing agent.

Thus, it would have been obvious for a person having ordinary skill in the art to modify the combination of Kingsley et al. and Akai to use a reducing agent and metal complex to deposit a uniform silver layer in a highly efficient manner (column 1, lines 9-15), as taught by Bahls.

With regards to the degassing and washing/drying stages of claim 34, the inclusion of such steps would have been obvious to one of ordinary skill in the art at the time the invention was made since it is well known in the art that in the deposition of layer material bubbles could be trapped and need to be released to allow for a smooth uniform surface and that after processing the finished product should be washed and dried to remove unused starting materials and waste products.

With regards to the limitations of claim 37, regarding the combination of metal complex and reducing agent prior to application on the layers, such a step would have been an obvious matter of design choice since applicant has not disclosed that the prior combination of complex and agent solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the agent and the complex applied separately.

13. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kingsley et al., Akai, and Bahls, as applied to claim 27 above, and further in view of Krulik et al. (US Patent # 5,232,492).

The combination of Kingsley et al., Akai, and Bahls discloses all of the limitations of the parent claim 27, as discussed above. However, the combination of Kingsley et al., Akai, and Bahls is silent with regards to the metal complex being gold cyanide or gold thiosulfate. Instead, the combination uses silver amine.

Krulik et al. teach the use gold cyanide as the metal complex in the electroless deposition of a gold film (column 1, lines 20-23).

Thus, it would have been obvious for a person having ordinary skill in the art to use a gold cyanide metal complex instead of a silver amine metal complex so as to provide a gold reflective layer instead of a silver reflective layer, as taught by Krulik et al.

14. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kingsley et al., Akai, and Bahls, as applied to claim 27 above, and further in view of Kozlov et al. (US Patent # 6,455,175).

The combination of Kingsley et al., Akai, and Bahls discloses all of the limitations of the parent claim 27, as discussed above. However, the combination of Kingsley et al., Akai, and Bahls is silent with regards to the metal complex being rhodium metal complex. Instead, the combination uses silver amine.

Kozlov et al. teach the use of rhodium metal complex in the electroless deposition of a rhodium film (column 4, lines 8-10).

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Thus, it would have been obvious for a person having ordinary skill in the art to use a rhodium metal complex instead of a silver amine metal complex so as to provide a rhodium reflective layer instead of a silver reflective layer, as taught by Kozlov et al.

15. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kingsley et al., Akai, and Bahls, as applied to claim 27 above, and further in view of Ferrell (US Patent # 6,180,524).

The combination of Kingsley et al., Akai, and Bahls discloses all of the limitations of the parent claim 27, as discussed above. However, the combination of Kingsley et al., Akai, and Bahls is silent with regards to the metal complex being copper amine. Instead, the combination uses silver amine.

Ferrell teaches the use of copper amine in the electroless or electroplating deposition of a copper film (column 1, lines 54-61).

Thus, it would have been obvious for a person having ordinary skill in the art to use copper amine instead of a silver amine metal complex so as to provide a copper reflective layer instead of a silver reflective layer, as taught by Ferrell.

### ***Double Patenting***

16. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

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A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

17. Claims 1, 4, 11, and 20 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2, 4, 12-13, 15, and 19 of copending Application No. 10/718339. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both provide for a similar layered reflector structure (i.e. smoothening layer, metal reflector, and protective top coat) to be used on an arrayed scintillator with gaps between individual scintillator elements for a CT imaging system.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Conclusion***

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yamamoto et al. (JP-04074870-A) disclose a method for electroless copper plating using a copper amine complex.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frederick F. Rosenberger whose telephone number is



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571-272-6107. The examiner can normally be reached on Monday-Friday 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Frederick F. Rosenberger  
Patent Examiner  
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